PRIOR ART

Fig 1

PRIOR ART

Fig 2

$$X_1 - X_n \qquad X_1 - X_n \qquad X_1 \quad X_0 \quad C$$

OR_n_k   EXOR_n_k   MU
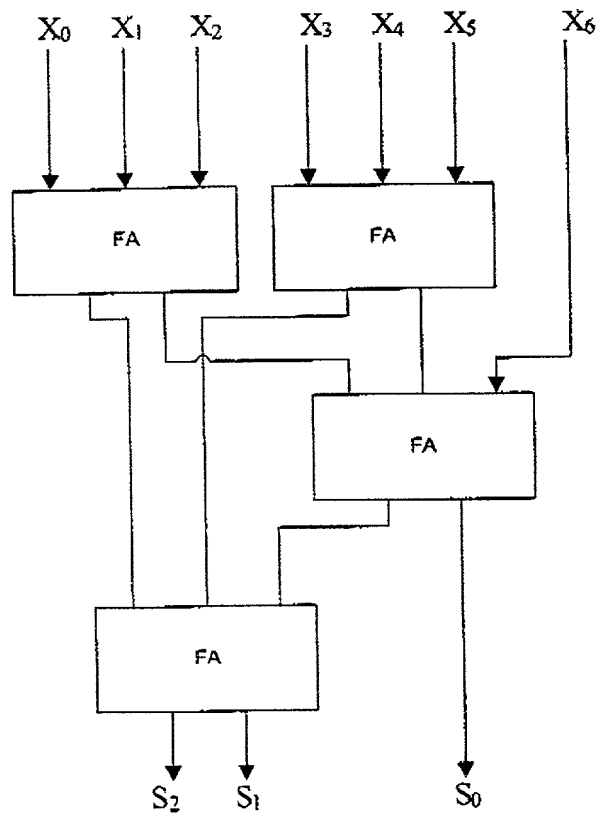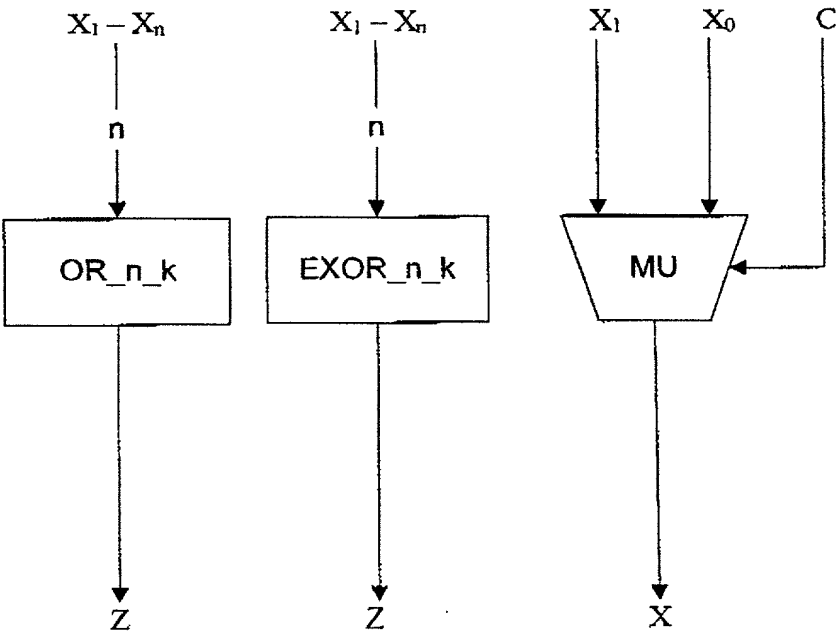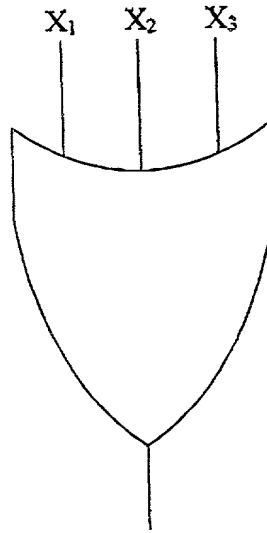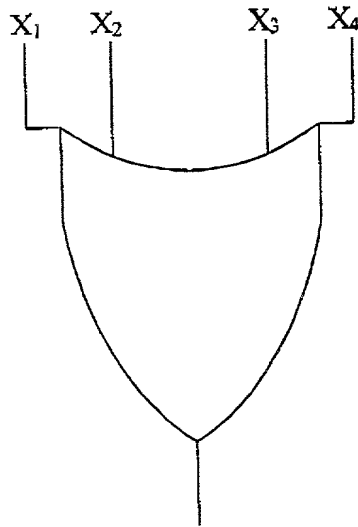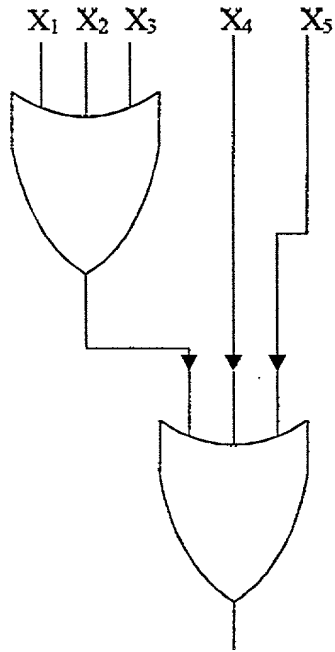
Fig 3

OR_3_1

Fig 4

OR_4_1

Fig 5

OR_5_1

Fig 6

EXOR_7_1
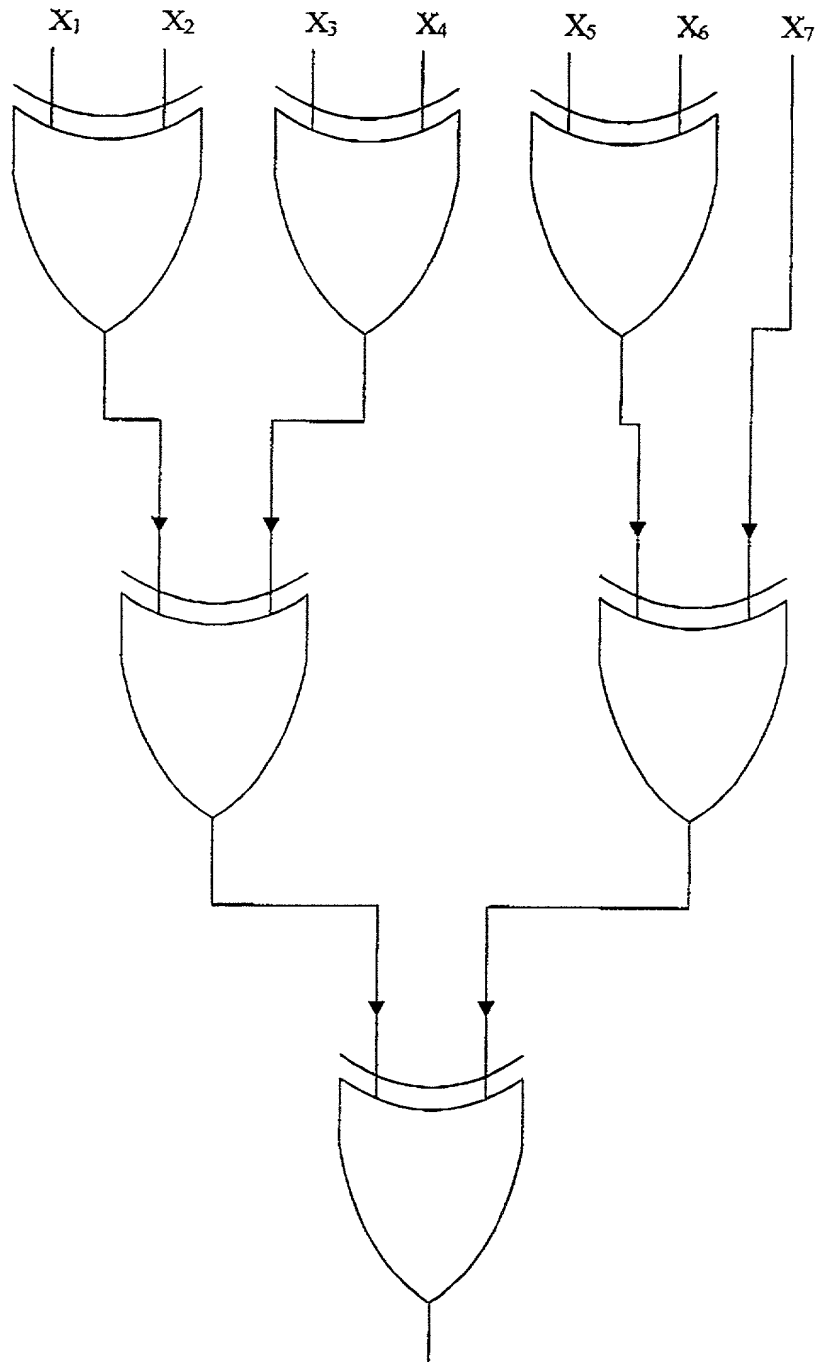
Fig 7

Fig 8
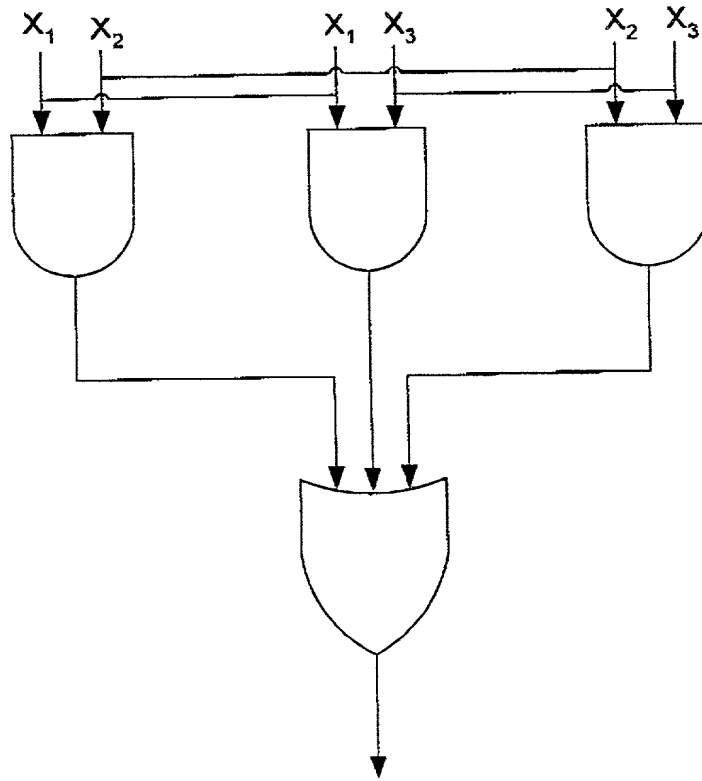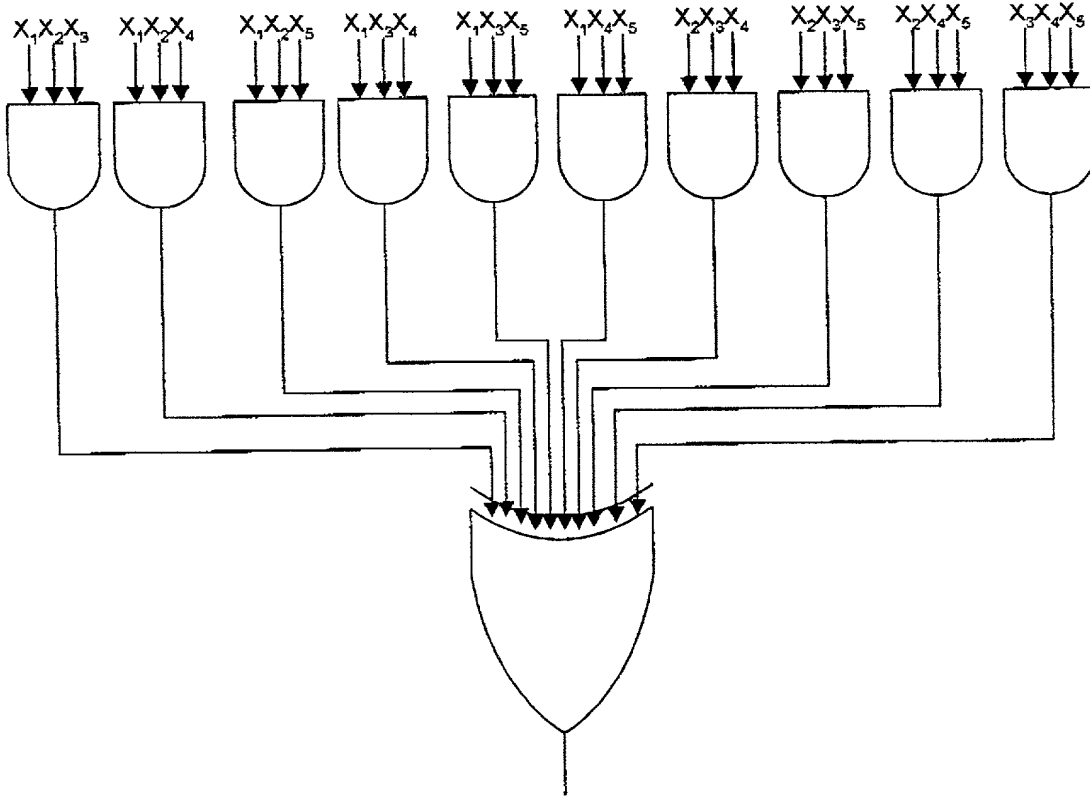
Fig 9

Fig 10

Fig 11

Fig 12

Fig 13

$X_1 X_2$ $X_3 X_4$ $X_5 X_6$ $X_7 X_8$ $X_9 X_{10}$ $X_{11} X_{12}$ $X_{13} X_{14}$ X_{15} 0

S_3 S_2 S_1 S_0

Fig 14
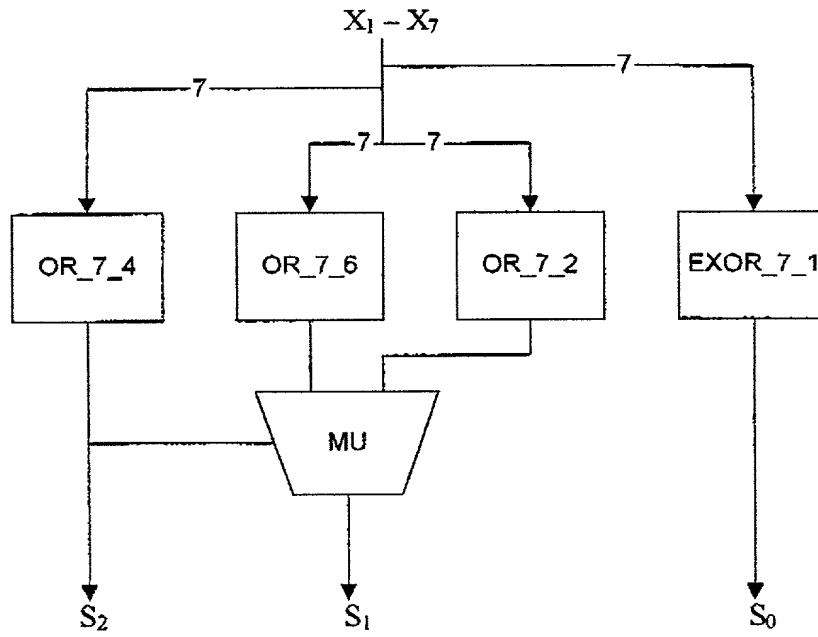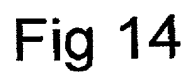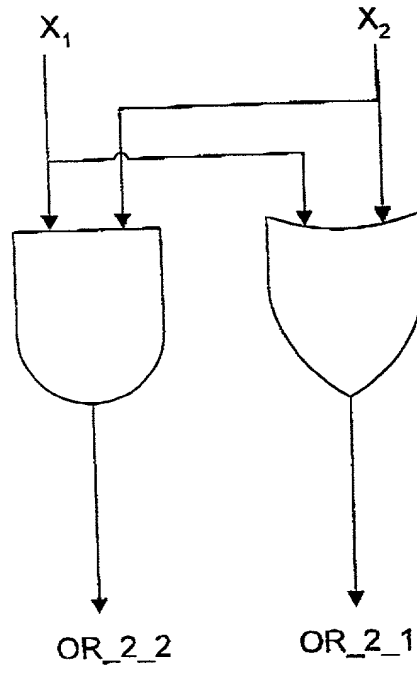
BLOCK 1

Fig 15
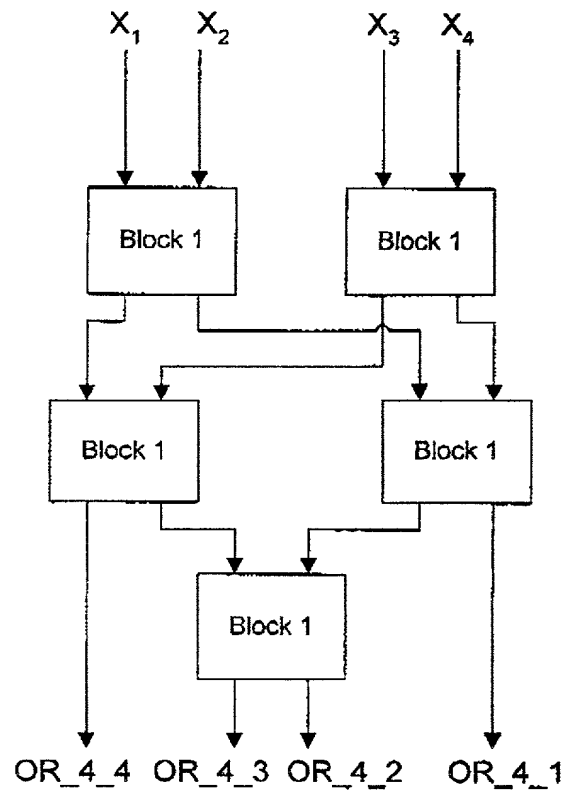
BLOCK 2

Fig 16

BLOCK 3
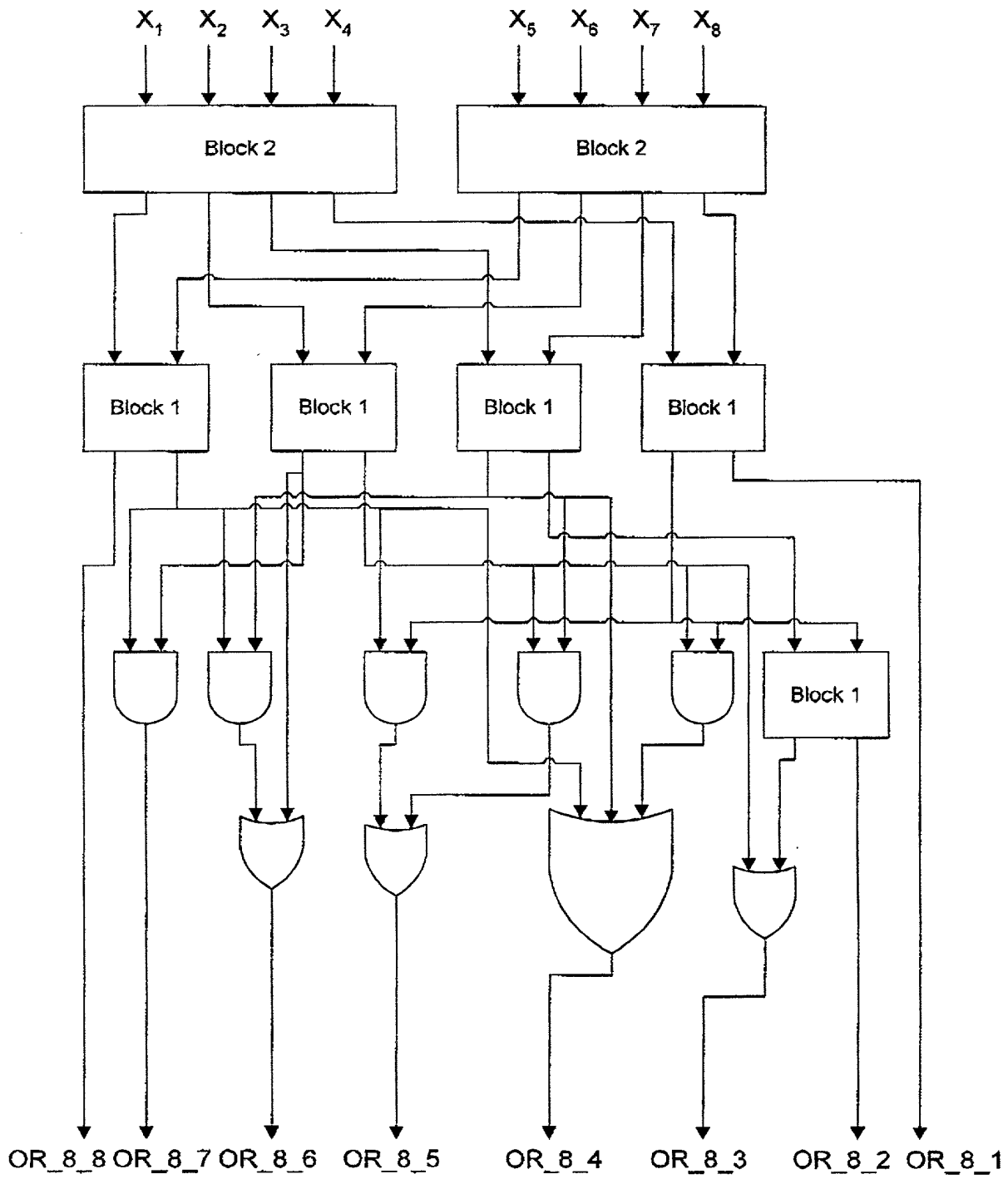
Fig 17

BLOCK 4
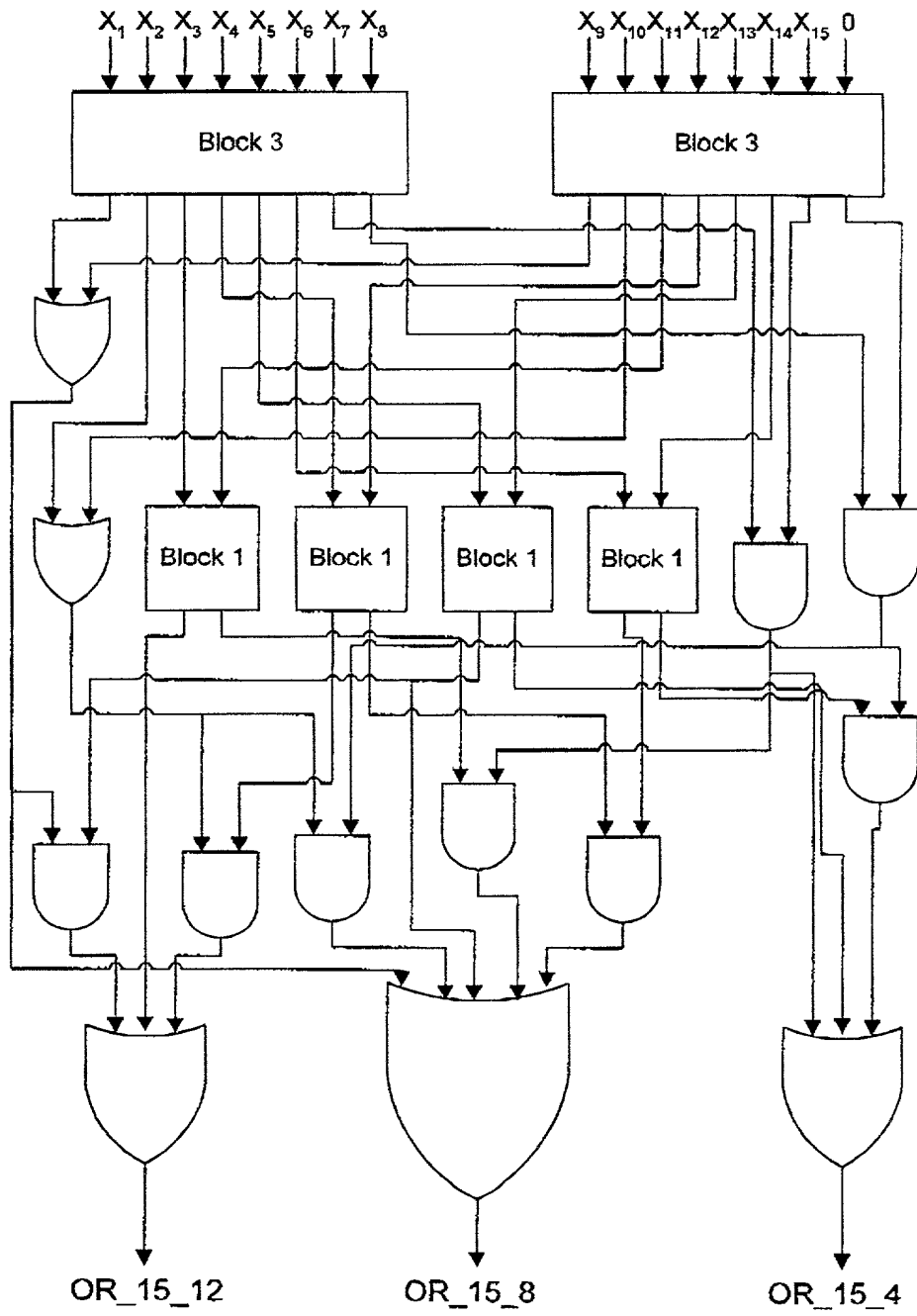
Fig 18

BLOCK 5
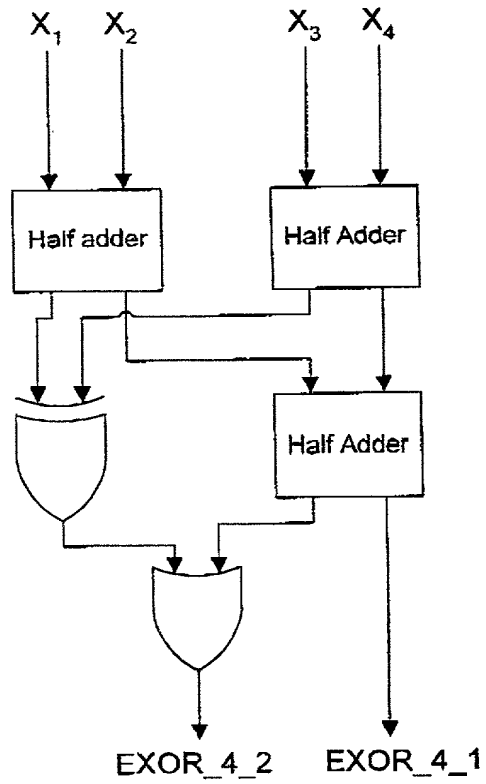
Fig 19

BLOCK 6

Fig 20

Fig 21

PRIOR ART

$$A_n - A_0 \qquad\qquad B_n - B_0$$

```
┌─────────────────────────────────────┐
│                                     │
│          Array Generation           │
│                                     │
└─────────────────────────────────────┘

┌─────────────────────────────────────┐
│                                     │
│          Array Reduction            │
│                                     │
└─────────────────────────────────────┘

┌─────────────────────────────────────┐
│                                     │
│        Addition of two numbers      │
│                                     │
└─────────────────────────────────────┘
```
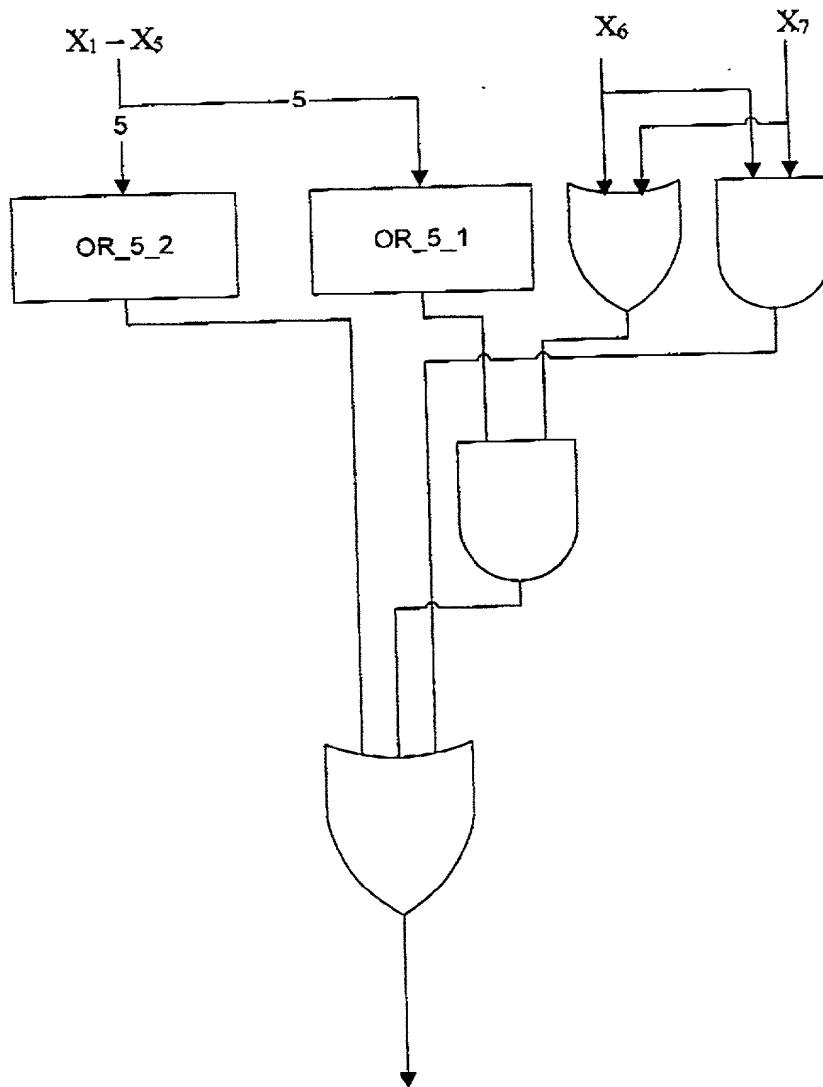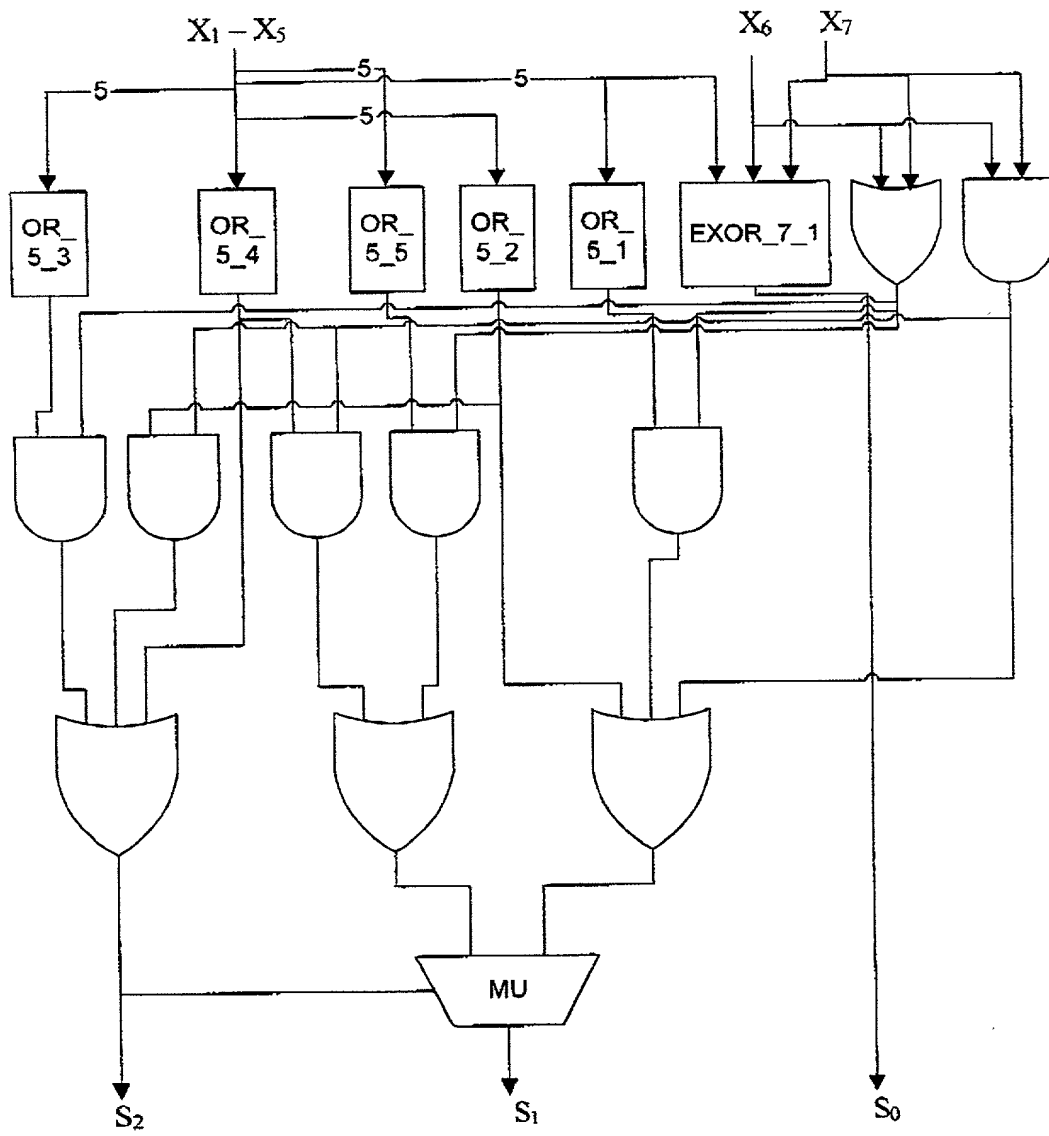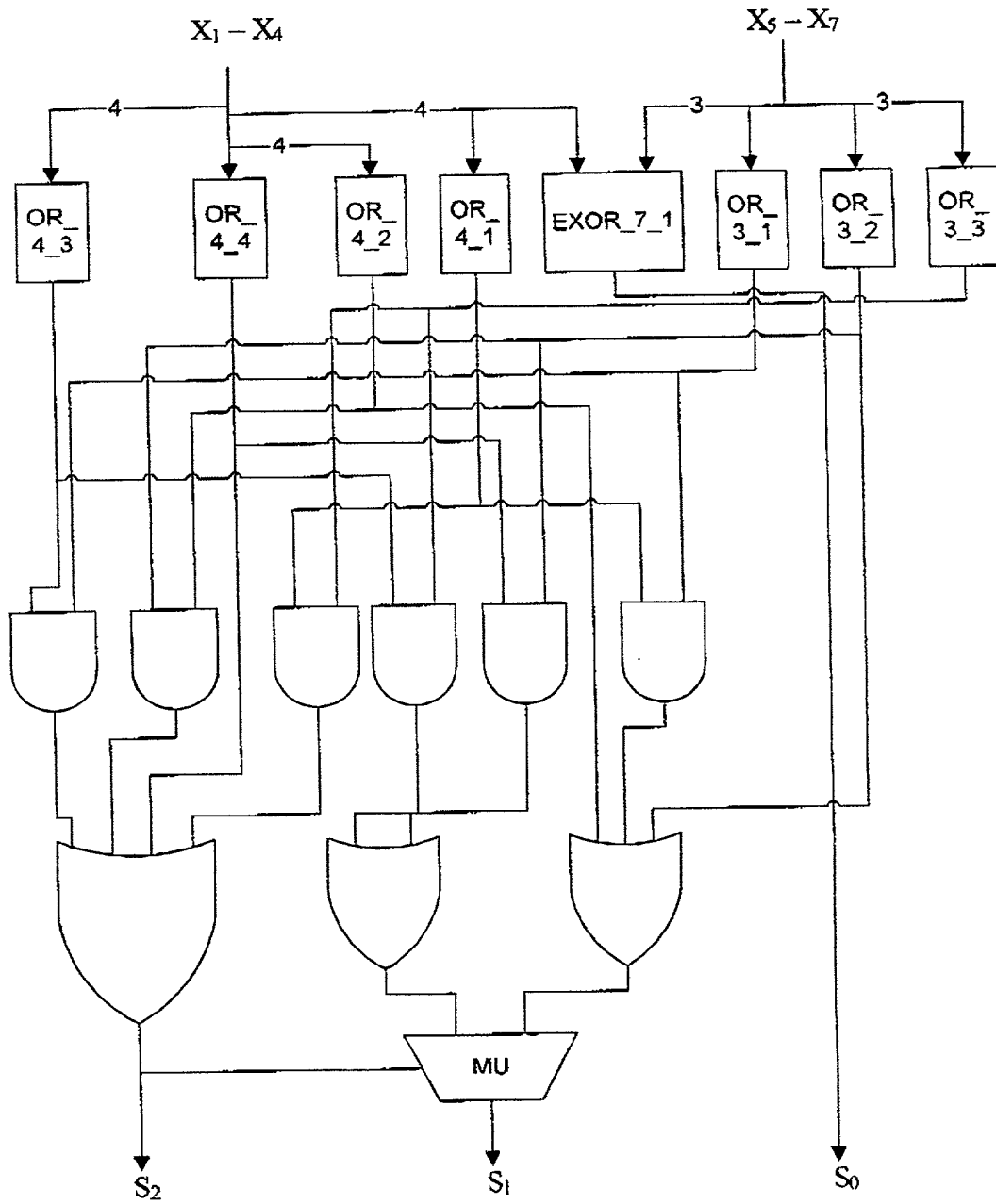
$$P_{2n-1} - P_0$$
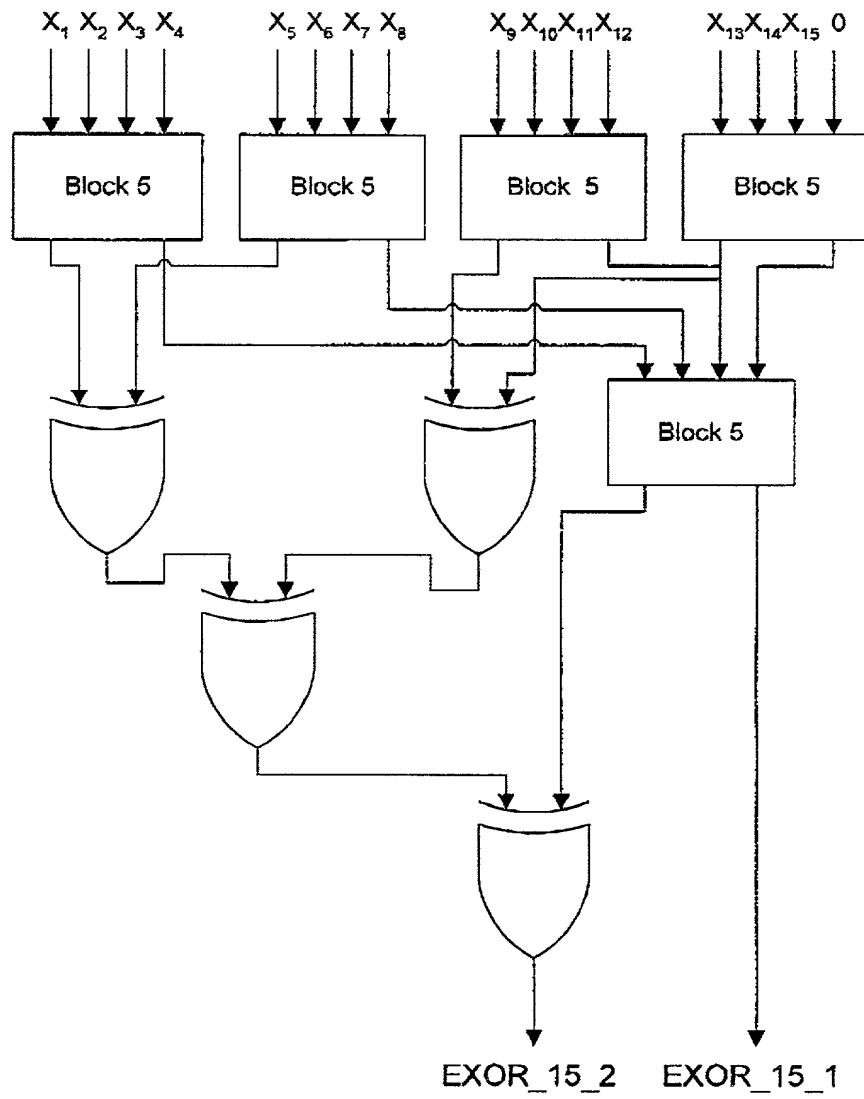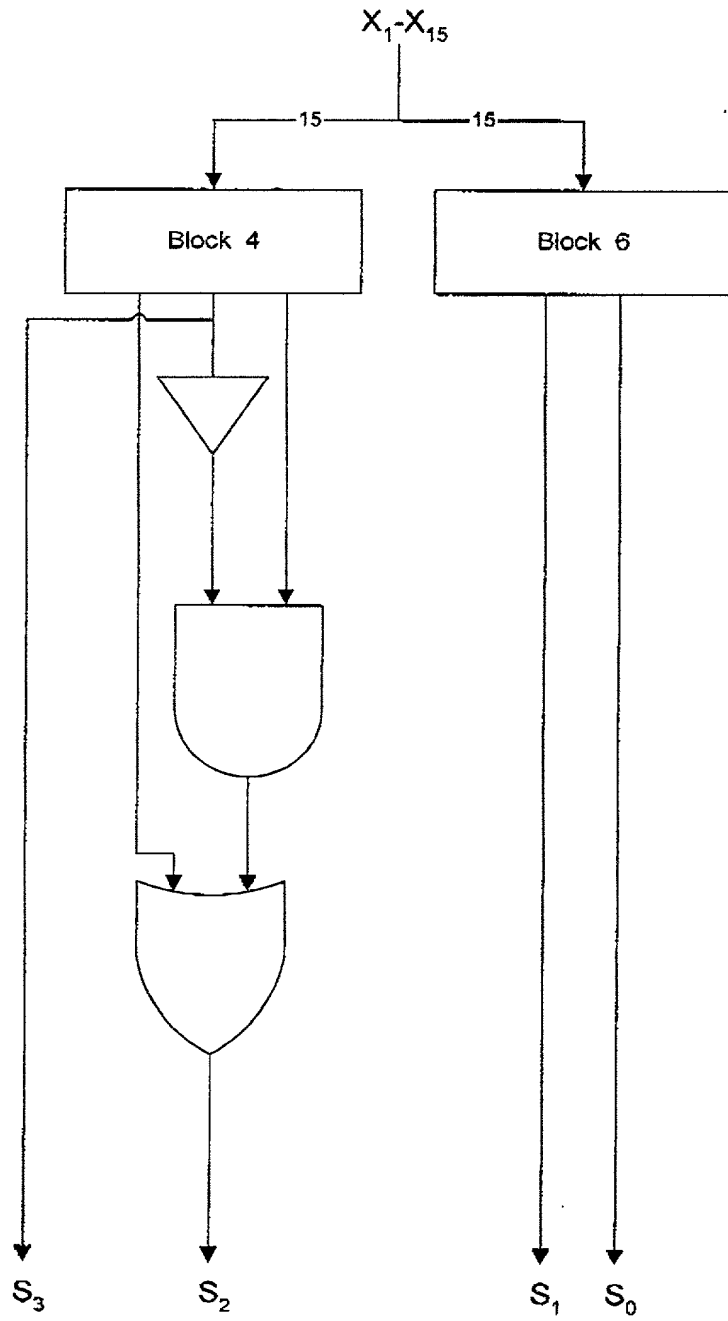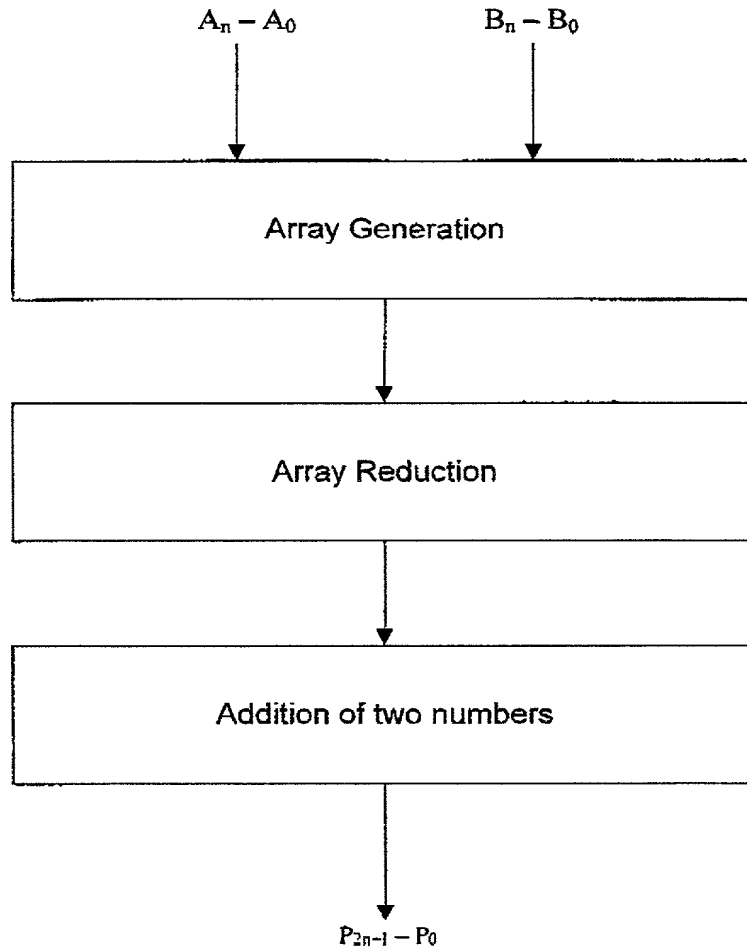
Fig 22

PRIOR ART

$$A_7B_0 \quad A_6B_0 \quad A_5B_0 \quad A_4B_0 \quad A_3B_0 \quad A_2B_0 \quad A_1B_0 \quad A_0B_0$$
$$A_7B_1 \quad A_6B_1 \quad A_5B_1 \quad A_4B_1 \quad A_3B_1 \quad A_2B_1 \quad A_1B_1 \quad A_0B_1$$
$$A_7B_2 \quad A_6B_2 \quad A_5B_2 \quad A_4B_2 \quad A_3B_2 \quad A_2B_2 \quad A_1B_2 \quad A_0B_2$$
$$A_7B_3 \quad A_6B_3 \quad A_5B_3 \quad A_4B_3 \quad A_3B_3 \quad A_2B_3 \quad A_1B_3 \quad A_0B_3$$
$$A_7B_4 \quad A_6B_4 \quad A_5B_4 \quad A_4B_4 \quad A_3B_4 \quad A_2B_4 \quad A_1B_4 \quad A_0B_4$$
$$A_7B_5 \quad A_6B_5 \quad A_5B_5 \quad A_4B_5 \quad A_3B_5 \quad A_2B_5 \quad A_1B_5 \quad A_0B_5$$
$$A_7B_6 \quad A_6B_6 \quad A_5B_6 \quad A_4B_6 \quad A_3B_6 \quad A_2B_6 \quad A_1B_6 \quad A_0B_6$$
$$A_7B_7 \quad A_6B_7 \quad A_5B_7 \quad A_4B_7 \quad A_3B_7 \quad A_2B_7 \quad A_1B_7 \quad A_0B_7$$

using 16 FA blocks

using 11 FA-s and 1 HA

using 7 FA-s

using 5 FA-s and 2 HA-s
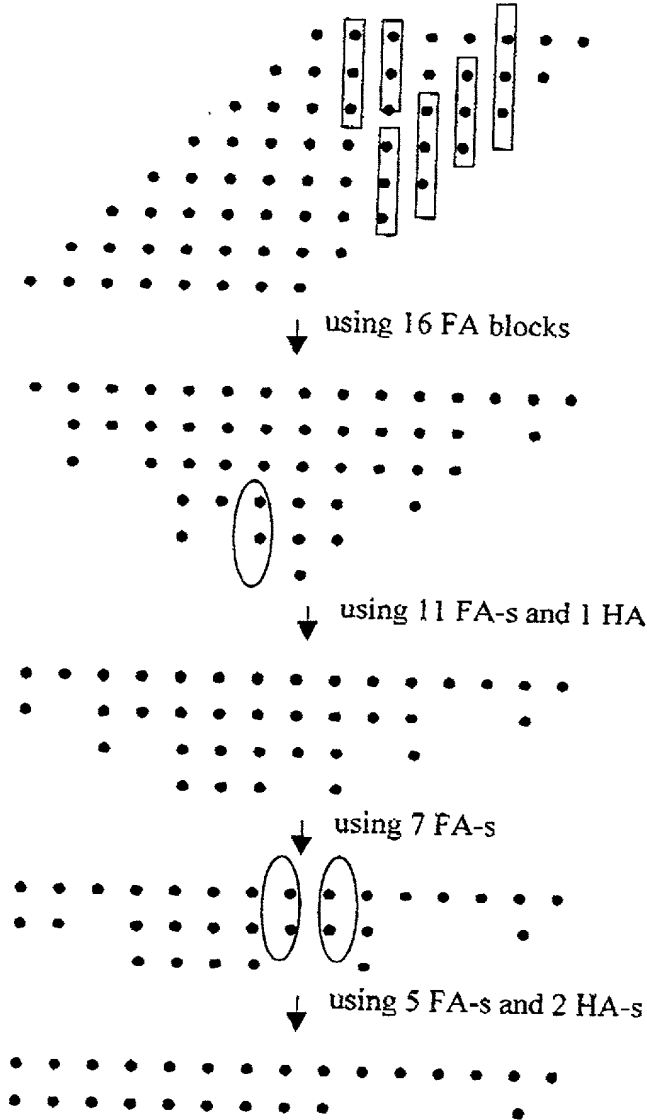
Fig 23

A_1B_0 A_0B_0

A_2B_1 A_1B_1 A_0B_1

A_3B_2 A_2B_2 A_1B_2

A_4B_3 A_3B_3 A_2B_3

A_5B_4 A_4B_4 A_3B_4

A_6B_5 A_5B_5 A_4B_5

A_7B_6 A_6B_6 A_5B_6

A_7B_7 A_6B_7

Fig 24

$$A_7B_0 \quad A_6B_0 \quad A_5B_0 \quad A_4B_0 \quad A_3B_0 \quad A_2B_0 \quad A_1B_0 \quad A_0B_0$$
$$Z \quad A_7B_1 \quad A_6B_1 \quad A_5B_1 \quad A_4B_1 \quad A_3B_1 \quad A_2B_1 \quad A_1B_1 \quad A_0B_1$$
$$A_7B_2 \quad A_6B_2 \quad A_5B_2 \quad A_4B_2 \quad A_3B_2 \quad A_2B_2 \quad A_1B_2 \quad A_0B_2$$
$$A_7B_3 \quad A_6B_3 \quad A_5B_3 \quad A_4B_3 \quad A_3B_3 \quad A_2B_3 \quad A_1B_3 \quad A_0B_3$$
$$A_7B_4 \quad A_6B_4 \quad A_5B_4 \quad A_4B_4 \quad A_3B_4 \quad A_2B_4 \quad A_1B_4 \quad A_0B_4$$
$$A_7B_5 \quad A_6B_5 \quad A_5B_5 \quad A_4B_5 \quad A_3B_5 \quad A_2B_5 \quad A_1B_5 \quad A_0B_5$$
$$A_7B_6 \quad A_6B_6 \quad A_5B_6 \quad A_4B_6 \quad A_3B_6 \quad A_2B_6 \quad X \quad A_0B_6$$
$$A_7B_7 \quad A_6B_7 \quad A_5B_7 \quad A_4B_7 \quad A_3B_7 \quad A_2B_7 \quad Y$$

15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0   - column numbers

using 1 HA, 3 FA-s, and 8 higher parallel counters

using 9 FA-s and 3 HA-s

Fig 25

Fig 26